UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,416	03/18/2005	Seiji Kawaguchi	265135US2PCT	4456

22850 7590 02/07/2008

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
CHOWDHURY, AFROZA Y	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
02/07/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/528,416	KAWAGUCHI ET AL.	
	Examiner	Art Unit	
	Afroza Y. Chowdhury	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/2/2007, 4/13/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Few foreign references in IDS are not considered since English translation is not provided.

Drawings

2. Figures 19 and 20 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 28, "**a non-voltage region having no voltage to the opposed electrode is formed for each pixel in a region within a same face as the pixel electrode and a size of the non-voltage region is such that even if the liquid crystal layer becomes bend orientation, at least a part of the region can maintain splay orientation**" is not clear. How a part of the non-voltage region can maintain splay orientation when the liquid crystal layer becomes bend orientation is not understood.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claim 31 is rejected under 35 U.S.C. 101 because it is regarding "a program of making a computer function as a driver in the liquid crystal display apparatus". It does not mention whether the program is in a recordable or storage medium.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 30 are rejected under 35 U.S.C. 102(b) as being unpatentable by **Hattori et al.** (US Pub. 2001/0020925).

As to claim 1, Hattori et al. discloses a liquid crystal display apparatus comprising:

a liquid crystal layer (fig. 7A(7)) using OCB mode liquid crystal ([0070], [0085]);

a driver (fig. 3(13)) applying a voltage to the liquid crystal layer ([0086]);

a liquid-crystal driving power supply supplying power to the driver ([0093]);

a switch (fig. 3(15)) outputting an on/off signal to the driver ([0088]); and

when an off signal is output from the switch, the driver applies a predetermined voltage which can be applied to each of pixels of the liquid crystal layer for a predetermined time and after the elapse of the predetermined time, stops the supply of

power to the driver from the liquid-crystal driving power supply (fig. 2, [0086] – [0089], [0103]).

As to claim 30, Hattori et al. teaches a liquid-crystal-display stopping method comprising: inputting an OFF signal to a driver of applying a voltage to a liquid crystal layer using OCM mode liquid crystal (fig. 3);

applying a predetermined voltage that can be applied to each pixel of the liquid crystal layer by the driver for a predetermined time when the OFF signal is input; and

stopping supply of power to the driver from a liquid crystal driving source supplying power to the driver after the predetermined period elapses (fig. 2, [0086] – [0089], [0103]).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 2, 17, 18, 28, 29, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925).

As to claim 2, Hattori et al. discloses a liquid crystal display apparatus where a pixel electrode to which an individual voltage is applied with respect to each pixel and an opposed electrode arranged opposite to each pixel electrode are disposed on the liquid crystal layer (fig. 3) and

application of a voltage to each of the pixels is performed between the pixel electrode and the opposed electrode (fig. 2, [0086] – [0089]).

Hattori et al. does not specifically teach whether the predetermined voltage is a voltage equal to or higher than a critical voltage of OCB mode liquid crystal.

However, it is obvious for the display device of Hattori et al. to apply a predetermined voltage that is a voltage equal to or higher than a critical voltage of OCB mode liquid crystal to complete faster transition between splay and bend orientation in order to reduce afterimage.

As to claim 17, Hattori et al. teaches a liquid crystal display apparatus wherein the voltage to be applied to each of pixels is an alternating voltage ([0046], [0087]).

As to claims 18 and 19, Hattori et al. teaches a liquid crystal display apparatus wherein the predetermined voltage is a uniform voltage for each of the pixels ([0046], [0087]).

As to claim 28, Hattori et al. discloses a liquid crystal display apparatus comprising: a liquid crystal layer using OCB mode liquid crystal (fig. 3),

in which a pixel electrode to which an individual pixel voltage is applied with respect to each pixel ([0086] – [0087]) and

an opposed electrode arranged opposite to the pixel electrodes are disposed (fig. 3),

wherein a non-voltage region having no voltage to the opposed electrode is formed for each pixel in a region within a same face as the pixel electrode (fig,. 7), and

Hattori et al. does not specifically teach a size of the non-voltage region is such that even if the liquid crystal layer becomes bend orientation, at least a part of the region can maintain splay orientation.

However, it is obvious to make a liquid crystal display apparatus with a size of the non-voltage region is such that even if the liquid crystal layer becomes bend orientation, at least a part of the region can maintain splay orientation for certain application ([0092]).

As to claim 29, it is a design choice to make a liquid crystal display apparatus wherein a size of the non-voltage region is 400 .mu.m.sup.2 or more.

As to claim 31, Hattori et al. does not disclose a program of making a computer function as a driver in the liquid crystal display apparatus.

However, it is obvious for the display device of Hattori et al. to have a program of making a computer function as a driver in the liquid crystal display apparatus applying a predetermined voltage that can be applied to each pixel of the liquid crystal layer for a

predetermined time when an OFF signal is output from the switch, and after the predetermined time elapses, stopping supply of power to the driver from the liquid-crystal driving power supply.

As to claim 32, it is obvious for the display device of Hattori et al. to have a recording medium carrying a program that can be processed by a computer.

12. Claims 2-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925) in view of **Ohta et al.** (US Pub. 2002/0149549).

As to claim 8, Hattori et al. discloses a liquid crystal display apparatus where when an off signal is output from the switch the driver applies a voltage for predetermined time (fig. 2, [0086] – [0089], [0103]).

Hattori et al. does not explicitly teach a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face.

Ohta et al. teaches a display device where predetermined voltage is applied in order to have black and white display to the pixels (figs. 12, 15, 16, [0010], [0015]).

Therefore, it is obvious to one skill in the art at the time of the invention was made to use the idea of applying a predetermine voltage to get black and white display of Ohta et al. into the display apparatus of Hattori et al. to make a liquid crystal display apparatus wherein the driver applies a voltage higher than a voltage at which

substantially black is displayed on a display face and equal to or lower than a maximum voltage which can be applied to the liquid crystal layer, to each of pixels of the liquid crystal layer for predetermined time instead of applying the predetermined voltage to each of the pixels and after the elapse of the predetermined time, applies a voltage at which substantially black is displayed on the display face, after the voltage at which substantially black is displayed on the display face is applied, applies a voltage at which substantially white is displayed on the display face, and after the voltage at which substantially white is displayed is applied, stops the supply of power to the driver from the driving power supply.

As to claim 3, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein the predetermined voltage is a voltage at which substantially black is displayed on a display face (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

As to claim 4, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage at which substantially black is displayed on a display face to each of pixels of the liquid crystal layer and then, applies a voltage at which substantially white is displayed on the display face, and then stops the supply of power to the driver from the liquid-crystal driving power supply (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

As to claim 5, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face, to each of pixels of the liquid crystal layer for predetermined time instead of applying a predetermined voltage to each of the pixels and after the elapse of predetermined time, stops the supply of power to the driver from the liquid-crystal driving power supply (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

As to claim 6, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face, to each of pixels of the liquid crystal layer for predetermined time instead of applying the predetermined voltage to each of the pixels and after the elapse of the predetermined time, applies a voltage at which substantially white is displayed on the display face to each of the pixels, and then stops the supply of power to the driver from the liquid-crystal driving power supply (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

As to claim 7, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein after the elapse of predetermined time, a voltage at which substantially black is displayed on a display face is applied instead of applying the voltage at which substantially white is displayed on the display face (figs. 12, 15, 16,

[0010], [0015], in Ohta et al.).

As to claims 9-12, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus wherein the voltage at which substantially white is displayed on the display face represents that a voltage between the opposed electrode and the pixel electrode, and a voltage between a gate line and the pixel electrode or a voltage between the pixel electrode and an electrode other than the pixel electrode are substantially zero (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

As to claims 13-16, Hattori et al. (as modified by Ohta et al.) teaches a liquid crystal display apparatus comprising: a backlight connected to the liquid-crystal driving power supply to irradiate the liquid crystal layer, wherein when an off signal is output from the switch, irradiation from the backlight is stopped simultaneously when or before a predetermined voltage is applied to each of pixels of the liquid crystal layer from the driver (figs. 12, 15, 16, [0010], [0015], in Ohta et al.).

13. Claims 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925) in view of **Yamakita et al.** (US Pub. 2002/0145579).

As to claim 20, Hattori et al. discloses a liquid crystal display apparatus wherein the liquid crystal layer is provided with a pixel electrode which is connected to the driver

and to which a pixel voltage is supplied and a specific electrode which is connected to the driver, to which a voltage different from the pixel voltage is supplied (figs. 3, 6, [0086]), and

which is disposed via a dielectric so as to be opposed to the pixel electrode, the pixel electrode is disposed so that at least a part of the contour of the pixel electrode is not vertical to the oriented direction of the OCB mode liquid crystal (fig. 7, [0017]).

Hattori et al. does not explicitly teach a display device where the driver generates an electric field in a direction different from the oriented direction of the OCB mode liquid crystal ([0036]).

Therefore, it is obvious to one skill in the art at the time of the invention was made to combine the display device of Yamakita et al. with the display apparatus of Hattori et al. to make a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver generates an electric field in a direction different from the oriented direction of the OCB mode liquid crystal between the pixel electrode and the specific electrode and after the elapse of predetermined time, stops the supply of power to the driver from the liquid-crystal driving power supply.

As to claim 21, Hattori et al. (as modified by Yamakita et al.) teaches a liquid crystal display apparatus wherein the contour of the pixel electrode includes a first portion which generates an electric field not vertical to the oriented direction of the OCB mode liquid crystal but in a direction of twisting a part of the oriented-directional liquid crystal in one direction in a pixel and a second portion which generates an electric field

in a direction of twisting another part of the oriented-directional liquid crystal in other direction ([0036], in Yamakita et al.).

As to claim 22 Hattori et al. (as modified by Yamakita et al.) teaches a liquid crystal display apparatus according to claim 21, wherein the first portion and the second portion are substantially parallel with the oriented direction of the OCB mode liquid crystal and alternately continuously formed ([0036], in Yamakita et al.).

As to claim 23, it is obvious for the liquid crystal display device of Hattori et al. (as modified by Yamakita et al.) to have an opposed electrode arranged opposite to each of the pixel electrodes is further disposed on the liquid crystal layer, when an off signal is output from the switch, the driver applies a voltage for substantially white display on a display face, between each of the pixel electrodes of the liquid crystal layer and the opposed electrode, thereafter, stops the supply of power to the driver from the liquid-crystal driving power supply.

As to claim 24, it is obvious for the liquid crystal display device of Hattori et al. (as modified by Yamakita et al.) when an off signal is output from the switch, the driver applies a predetermined voltage equal to or higher than a critical voltage of the OCB mode liquid crystal but equal to or lower than the maximum voltage which can be applied to the liquid crystal layer to each of pixels of the liquid crystal layer, thereafter,

applies a voltage for substantially white display on a display face, thereafter stops the supply of power to the driver from the liquid-crystal driving power supply.

As to claim 25, Hattori et al. (as modified by Yamakita et al.) teaches a liquid crystal display apparatus wherein an electric field in a direction different from the oriented direction of the OCB mode liquid crystal is applied simultaneously when or after the voltage for white display on the display face is applied ([0036], in Yamakita et al.).

As to claim 26, Hattori et al. (as modified by Yamakita et al.) discloses a liquid crystal display apparatus wherein two pixel electrodes adjacent in the oriented direction of the OCB liquid crystal mode are arranged on the specific electrode via a dielectric, and contours of the two pixel electrodes are arranged so that they are not vertical to the oriented direction of the OCB mode liquid crystal and include a first portion of generating an electric field in a direction of twisting a part of the oriented-directional liquid crystal in one direction in a pixel and a second portion of generating an electric field in a direction of twisting another part of the oriented-directional liquid crystal in other direction ([0036], in Yamakita et al.).

As to claim 27, Hattori et al. (as modified by Yamakita et al.) teaches a liquid crystal display apparatus wherein the driver applies voltages having phases opposite to each other to the two pixel electrodes (fig. 7, [0006]).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Afroza Y. Chowdhury whose telephone number is 571-270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
2/1/2008

BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600